

ADDENDUM.

THE CLIMATE OF PUERTO RICO.

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The Chief of Bureau takes pleasure in stating that Prof. Mark W. Harrington is now in Puerto Rico engaged in organizing a section of the Climate and Crop Service of the Weather Bureau. Regular weekly and monthly reports will be furnished at an early date, meanwhile, he has the satisfaction of presenting the following first report from Professor Harrington, dated November 5, relative to the general conditions in Puerto Rico, which was received just in time for insertion in the September REVIEW:

The published observations in Puerto Rico are very scanty, consisting of a total of about nine years at San Juan only, and these are fragmentary, being scattered through twenty years. They show a true tropical climate with a high mean temperature (78.9° F.), and very little difference in season except in rainfall. The coldest month on the average is February (75.7°), and the hottest, June (81.5°), but December to March are very much alike in temperature, and so are the months from June to September. The very coldest month on record is January, 1895 (70.0°), and the very warmest is June, 1878 (86.0°).

The average change from the coldest to the hottest is only 6°, but this is very appreciable to one who has lived long in the tropics. The cool months really seem to the natives to be decidedly cool, requiring additional covering on the bed, and heavier clothing. The coldest temperature on record in San Juan is 57.2°, on a day in January, 1894. The very hottest on record is 100.8°, on a day in May, 1878. The absolute range of temperature observed is, therefore, between 43° and 44°. The former temperature is far above frost, but would seem to the natives very cold, and would check the growth of tropical plants. The latter would seem very hot, for the air of San Juan is very moist and the evaporation of moisture is slow.

The comfort of San Juan as a place of residence, not to mention its healthfulness, is very much increased by the "briza," which is not given in the published reports. This is the northeast trade which has been turned toward the west, until the "briza" comes quite regularly from the east. It is not felt much during the day, but springs up late in the afternoon and lasts through the evening. It is a soft, gentle breeze, laving the body and giving an effect which is most fresh and delightful. It has a regularity approaching that of the sun, and Santurce and Catano, two suburbs of the capital, get it both more strongly and through a larger part of the twenty-four hours. At Catano it may be felt until the middle of the forenoon, and begins again mid-afternoon. At Santurce it makes the nights positively cool.

The year at San Juan is divided into the dry season and the wet season, but the dry season has about as much rainfall as the northeastern States, and the wet season more than twice as much. The dry season embraces the months from December to March, with a rainfall of 10 or 11 inches. It is the most attractive season of the year, relatively dry and cool. It is the proper season for the visits of northerners to San Juan, and winter residents would find its climate very gentle, mild, and safe. The wet season embraces the other eight months in the year, and has a rainfall of 48 to 49 inches, or more than the whole of the year for most of the United States. The total rainfall at San Juan is nearly 60 inches, and the culmination is in November when an average of nearly 8 inches falls.

The rainfall is not excessive. It is equaled in many places in the Southern States and in the northern part of the Pacific coast, and is surpassed in many places. It is less significant from the ease with which the rain comes down. There are few threatenings of storms for days beforehand. There is little wind and little lightning. Rainy

days are rare, but rainy afternoons or evenings, for an hour or two, common. The rain begins suddenly, falls heavily, and ends soon.

There is no impression of a rainy climate, except that everything seems constantly fresh and clean.

The healthfulness of San Juan is the greatest of any city in the West Indies. Yellow fever is never at home, and when imported it rarely, if ever, spreads. Malarial fevers are very rare in the city, and some cases of dysentery and typhoid occur. The little city has no waterworks in a condition to be used; it stands on a coral island which rises to a summit of 100 feet or more, and is only three miles long by half a mile broad; there are a few open sewers, and between the city authorities and the heavy rainfalls it is kept quite clean.

The great climatic misfortune of San Juan is the hurricane, which occasionally visits it in the latter part of the rainy season (from August to October). It comes on very much as general storms do in the North, with lowering sky, rising winds, and general threats of an impending storm; but it comes from the east, while our storms are generally from the west. It is much more intense than our storms, but is very much rarer. Its usual earliest sign is a booming sea without apparent cause, for waves propagate themselves faster than wind travels. Hurricanes are rare in San Juan. The last occurred in 1876. They usually pass to the south or west of Puerto Rico.

The climate of the rest of the island is much like that of San Juan, with modifications, due to elevation above the sea, and to changes in the "briza," due to the topography. The change of temperature with elevation is relatively rapid here, being apparently about 4° of temperature to every 1,000 feet.

Now, Mt. Yunque, at the northeastern angle of the island, is, according to the chief of the department of engineers of the island, about 6,000 feet high, and its summit would have a mean temperature as low as that of many places in the States. Besides, elevations of 2,000 feet are not unusual for towns. Snow apparently never falls on the island, but hoar frosts are reported as occasional in high places. Several towns of some size in the interior have a popular reputation as being cold—Cayay, Adjuntas, and Utuado. That black frosts do not occur, however, is evident from the fact that the banana grows freely up to at least 2,000 feet and is very sensitive to frost.

There appears to be three mountain ridges running from end to end in the island, but the central is the commanding one, and the elevations are on the whole highest toward the eastern end and especially at the northeastern angle. The result is that the "briza" most wets and refreshes the eastern end of the island and the rainfall changes greatly from point to point. Judging by Jamaica, of which the climate has been carefully studied, the heaviest rainfall is in the northeast and it may here in places amount to 100 inches annually, or more. In Jamaica it is known to surpass 200 inches in some places, and El Yunque as seen from San Juan is very generally capped by rain cloud. The interior valleys of the island are relatively dry, while the northern and eastern mountain slopes are wet. A few protected places are reported as so dry that rain may not fall for an entire year or more, but these spots must be small.

The general appearance of the island is most attractive and vernal. The vegetation is luxuriant and clothes the mountains to their very summits. Very little bare rock is seen anywhere. The island is one of the best watered in the world. It is said to have 1,200 streams with names, of which 71 can be called rivers, and 5 or 6 are of considerable size. In crossing the island from Ponce to San Juan on the mountain road, one crosses over 50 bridges besides fording several streams at the southern end. Waterpower is extremely abundant and could provide power for a large part of the work required in the island. It suffers however the marked disadvantage that the streams are subject to sudden and severe floods. Two or three weeks ago the Coamo River rose 15 or 20 feet and fell again in one night. Its highest point was marked by the limbs of trees and other vegetation which it had plastered against the arches of a high bridge. A heavy afternoon rain in the mountains about its source had caused the sudden rise.

